abilities of current receivers to avoid interference between ATV and NTSC signals.

A meaningful evaluation of interference immunity issues will require greater precision concerning the ATV signal to be used, must accurately reflect the diverse population of receivers currently in operation, and will require more comprehensive technical and statistical analyses. While some of the inputs for such a study must await further developments, NA Philips makes the following suggestions in anticipation of additional efforts by the Advisory Committee in this area:

- Testing should be conducted with actual ATV signals to determine the susceptibility of the high definition picture to degradation (taking account of the greater resolution that is expected and the increase in screen sizes relative to the viewing distance).

- Videocassette recorders should be included in the testing procedures, given that VCRs now represent approximately one-third of total consumer video equipment sales.

- Signal properties of ATV signals (e.g., spectral distribution, (sub)carriers present, offset possible to reduce visibility of interference) should be tested to determine comparative effects of candidate ATV systems on NTSC signals.

- Both objective and subjective tests are needed. With respect to the former, actual physical measurements should be made at the tuner (to measure image rejection, third intercept point, etc.)

III. THE COMMISSION SHOULD COMMIT TO THE EXPEDITIOUS PROMULGATION OF A SINGLE, ENDURING, NTSC-COMPATIBLE HDTV STANDARD FOR TERRESTRIAL BROADCASTING THAT IS BASED ON PARAMETERS SUITABLE FOR USE BY OTHER VIDEO DISTRIBUTION MEDIA.

The Commission should establish a mandatory standard for terrestrial broadcast of HDTV. This standard should be based on parameters which are suitable for use by other video delivery media. The standard should be based on industry consensus and implemented in a single step, maintaining compatibility with NTSC.

A. A Mandatory Standard For Terrestrial Broadcasting Of HDTV Is Essential.

NA Philips believes strongly that, for timely and effective introduction of ATV, the Commission must promulgate one mandatory standard for terrestrial broadcasting of HDTV which permits broadcasters to maintain competitive parity with other delivery media. (¶¶ 113-115, 117, 122 Q.4) Failure to do this would retard or diminish the impact of ATV and lead to a lessening of the competitive position of terrestrial broadcasters. Alternative approaches, such as reliance on "marketplace forces," or expectations of what can be accomplished by "open architecture" receivers, simply will not get the job done.

Reliance on the marketplace to select a standard would be ill-advised. Broadcast implementation of ATV can occur only if consumers, equipment manufacturers,

distribution media, and program producers are willing to make investments in equipment, technology, service, and promotion. Progress will not occur if stakeholders face the danger that their investment will be lost if they choose the "wrong" system, i.e., one that does not prevail in the marketplace. (¶ 113)

AM stereo has been cited often as an example of industry's failure to implement a technology because of the absence of a single standard. AM radio would undoubtedly have benefited were it able to deliver the improved listening experience of stereo; the lack of stereo capability is one of the primary reasons why AM continues to lose ground to the competing medium of FM radio. The absence of a single standard has made production and program distribution decisions too risky, and AM radio continues to stagnate.[13] The same unhappy results are likely if the Commission relies on the marketplace to produce a de facto standard. (¶ 122 Q.3)

13/ We speak with rueful authority on this point. NA Philips' subsidiary, The Magnavox Company, proposed an AM stereo standard which was initially chosen by the Commission, but the Commission later decided not to establish a standard. See "FCC Instructs Staff to Propose the Selection of Magnavox's AM Stereo System (Docket No. 21313)," Rep. No. 15657 (Apr. 9, 1980); AM Stereophonic Broadcasting, 47 F.R. 13152 (Mar. 29, 1982). Because AM stereo has never been widely implemented by broadcasters, Magnavox has never marketed a radio capable of receiving AM stereo.

"Protection" of a system is likewise not an acceptable alternative to the selection of a single mandatory standard. (¶¶ 116, 122 Q.4) Such an approach would tend to introduce uncertainty, which in turn will retard the investments necessary for timely deployment. Even worse would be a decision to "protect" only "key aspects" of a system rather than a complete system. Again, this would introduce uncertainty and retard investments; it would also leave the door open for multiple incompatible systems, with all the disadvantages that entails. Choosing a system with sufficient flexibility is by far the better approach. Just as NTSC has proven to be very durable because of its flexibility, so too can (and should) the HDTV standard established for terrestrial use accommodate later technological improvements.

B. Open Architecture Receivers Are Not An Acceptable Alternative To The Prescription Of A Standard.

Another proposed alternative to the adoption of a mandatory standard is reliance on an "open architecture receiver" approach. (¶¶ 119, 122 Q.5) We believe, however, that such an approach is unworkable and unwise. It would not serve consumers or industry.

OAR would be logical only if multiple, incompatible ATV systems are expected to emerge. OAR not only

NA Philips draws the Commission's attention to the unanimous opposition of television receiver manufacturers to the OAR concept. The reasons for that opposition have been expressed in correspondence with both the Commission and its Advisory Committee.[15] Those reasons will not be recited here. Suffice it to say that consumer electronics manufacturers have an interest in marketing as many ATV receivers as early as possible, and their unanimous opposition to OAR should send a telling message to the Commission.

Continuing improvements in consumer cost, performance, and features of NTSC receivers have resulted from manufacturers' continual efforts towards cost optimization for a high volume production of affordable consumer equipment. Given all known HDTV technologies, HDTV receivers will be more complex (and therefore more expensive) than presently existing NTSC sets. The additional expenses inherent in OAR can and should be avoided. The Commission's goal should be to foster the best possible service to consumers at the lowest possible cost. OAR is not the way to reach that goal.

15/ See, e.g., Letter from Gary J. Shapiro and Eb Tingley, EIA/CEG Vice Presidents, to Dennis R. Patrick, FCC Chairman, at 1-6 (June 30, 1988); Letter from F. Jack Pluckhan, Matsushita Electric Corp. of America, to Richard E. Wiley, Advisory Committee Chairman, at 2-4 (June 30, 1988); Letter from Thomas M. Hafner, NA Philips Senior Counsel, to Richard E. Wiley, Advisory Committee Chairman, at 2 (June 30, 1988).

permits, but promotes, an environment in which several incompatible systems vie for acceptance, causing confusion and delay. The choice of one standard for terrestrial broadcasting, consistent and easily transcodable for alternate media, eliminates the need for an open architecture receiver.

Questions of logic aside, OAR's technical and economic feasibility is also doubtful. To create a receiver with the capability to decode multiple HDTV signals would inevitably be very expensive; signal processing isn't free, and the ability to decode incompatible inputs would require much greater technical complexity and expense.[14] This complexity and expense would inevitably delay consumer acceptance of advanced television technology, hindering the implementation of HDTV. Independent of technical and cost considerations, the multiple standards that would accompany OAR would cause consumer confusion, and this too would hinder market penetration.

14/ The technical implications of an open receiver architecture are not yet fully known but could include requirements for larger power supplies, interface circuits (buffers, translators, etc.), interfaces externally accessible by means of connectors, chroma decoding different from the standard YIQ decoding to match the phosphor characteristics of the different CRTs for each manufacturer, tuning systems designed for all possible systems, and variable scan rate converters.

It should be noted that the foregoing comments about OARs do not necessarily apply to multiport receivers. TVs and VCRs today have multiport capabilities, allowing for signal inputs at different stages of the signal processing process. Extension of the multiport receiver concept to the HDTV environment will permit the reception and display of consistent signals having common baseband parameters but with different modulation schemes necessary for the characteristics of different media, without the complexity of an OAR. Common video baseband and display parameters, however, would still be required.

C. The Terrestrial HDTV Standard Should Be Durable.

The mandatory standard for terrestrial HDTV broadcasting should not be limited in duration. (¶ 118, 122 Q.6) A properly chosen standard with sufficient quality, adaptability, and headroom for improvement will eliminate the need for a time limitation. (¶¶ 115-116) Once in place for a suitable length of time, investments in equipment will keep such a standard in place for as long as it is technically and economically appropriate.

To limit the standard's lifetime would send a strong signal that broadcast and receiving equipment designed to that standard would become obsolete. This, of course, would inhibit investment and delay deployment.

Alternatively, the "sunset" date could be set many years in the future (e.g., 25 years), but such a limitation would be virtually meaningless. The better approach is for the Commission to prescribe a single standard without fixed duration, thus giving consumers and industry the stability they deserve.

D. The Terrestrial HDTV Standard Should Have Video Baseband Parameters Suitable For Use By Other Video Distribution Media.

The terrestrial standard prescribed by the Commission should be consistent and compatible with those used by other media, reducing the complexity required of consumer receiving equipment and avoiding confusion among consumers. (¶¶ 127-130, 134 Q.1) Thus, a system which consists of easily transcodable satellite and terrestrial components is in the best interest of consumers, and would also serve the needs of competing media and equipment manufacturers as well. The choice of a compatible and consistent set of standards will reduce the likelihood of inconsistent, de facto standards for alternate media. (¶ 122 Q.3)

If the Commission declines to establish a mandatory standard for terrestrial broadcasting, a de facto standard is not likely to emerge; instead, as noted above, terrestrial broadcasting is likely to fail to introduce HDTV

in a timely manner. De facto standards for alternate media, however, are not only possible, but probable. Statements of representatives of various media throughout the standard-setting process have shown the existence of intermedia competition.[16] Any medium that can deploy HDTV, with the requisite programming and hardware, will do so. At least one DBS proponent has stated that the first implementation of HDTV will be via DBS in the early 1990's.[17] A successful introduction of non-NTSC-compatible ATV via DBS could well result in the establishment of a de facto standard for that medium. Such a de facto standard would then likely affect the choice of the terrestrial standard.

16/ For example, "each medium should be free to transmit the highest quality signal possible, and . . . no medium necessarily should be confined to a standard used by another transmission medium." Letter from Henry J. Gerken, American Televisions & Communications Corporation's Senior Vice President, to Richard E. Wiley, Advisory Committee Chairman, at 1 (June 29, 1988). In the same vein, CBS has commented that, "to be competitive and to sustain their current level of local and other public service, terrestrial broadcasters will need to offer a full HDTV quality service to their audiences." Separate Statement of CBS, Inc. on the Interim Report of the FCC Advisory Committee on Advanced Television Service, at 2 (undated), accompanying Letter from George Bradenburg III, CBS Vice President, to Richard Wiley, Advisory Committee Chairman (July 1, 1988).

17/ Statement by Stanley Hubbard, President of Hubbard Broadcasting, at a seminar entitled "HDTV and the Business of Television in the 1990's" sponsored by the law firm of Davis, Graham, and Stubbs on September 9, 1988.

NA Philips strongly urges the Commission to encourage a harmonious relationship of any proposed terrestrial standard to alternate media. In particular, the interrelationships of broadcast and cable necessitate that any ATV signal chosen for broadcast be suitable for transmission over cable. The same receiver could then be used and the expense of headend conversion could be avoided. Moreover, because virtually all television signals are transmitted over satellite for distribution, any terrestrial signal must also be easily derived from a satellite transmission.

NA Philips' HDS-NA system was specifically designed for use with terrestrial, cable, and satellite transmission. HDS-NA has been successfully demonstrated over a hardware-simulated cable distribution system in March 1988, and it will be tested on satellite transmission with Hughes Communications in 1989. Plans for terrestrial broadcast and cable field tests are also progressing.

The interests of consumers in lowest costs for receiving equipment require that the alternate media use the same video baseband parameters as terrestrial broadcast ATV receivers. Multiple non-compatible standards will require interfaces for the different media to be handled by consumer receiving equipment. The result may be an unnecessary increase in the cost of consumer products and a decrease in

the quality of the ATV viewing experience. These results will be detrimental to the acceptance and implementation of ATV.

E. The Terrestrial HDTV Standard Should Be Promulgated By The Commission, Based On Continuing Industry Input.

The Commission should adopt an ATV standard for terrestrial broadcasting with industry consensus to insure integrated and efficient development efforts by participants from all interested industries, resulting in early implementation and acceptance. (¶¶ 121, 134 Q.2) This industry consensus should be obtained through the recommendations of the Advisory Committee, based on studies of technical, economic, and policy factors, with participation by interested parties. The Commission should, of course, continue to allow for direct input from broadcasters, equipment manufacturers, and other interested parties via additional Notices of Proposed Rulemaking.

The Commission should carefully consider the Advisory Committee's recommendations and inputs from other parties. Then, using its public interest authority and obligations, the Commission should select the ATV terrestrial broadcast standard that is best for American consumers. The interests of consumers, broadcasters, and

receiver manufacturers require that the standard be compatible with the needs of other media as well.

There will continue to be a role for industry groups such as the Advanced Television Systems Committee and the Electronic Industries Association. Once the Commission has made a final decision for terrestrial broadcast of HDTV, these organizations can bring interested parties together to finalize technical details of consistent set of standards to be used by all other media (satellites, cable, VCRs, video disc, compact disc video). But the responsibility to select a standard for terrestrial broadcasting belongs to the Commission.

F. Standards Decisions Should Be Made As Soon As The Advisory Committee Process Permits.

One of the most important and difficult questions which the Commission faces is when to establish a standard. Answering this question will involve complex technical, economic, and political considerations.[18] NA Philips supports the Commission's evident intention to press forward expeditiously. It would, of course, be premature for the Commission to select a specific system at this time.

18/ Among the factors that need to be considered are the speed of developmental efforts by various HDTV system proponents, the testing schedule established by the Advisory Committee, and the competitive relationships among video delivery media.

(¶¶ 113, 120, 122 Q.2) Comparative testing and evaluation of competing systems' operating hardware should continue according to the schedule established by the Advisory Committee.[19]

It is however, timely for the Commission to provide additional guidance to industry and to the Advisory Committee by resolving these issues which are ripe for resolution. For example, the Commission can safely decide now that there should be a single step transition (from NTSC to HDTV, but with full NTSC compatibility retained), that a single HDTV system will be selected which serves satellite, cable TV, and terrestrial broadcast needs, and that terrestrial broadcasters will be permitted to provide HDTV by means of a system which requires only an additional half channel per broadcaster.

G. Terrestrial Broadcast Of HDTV Should Be Implemented As Soon As Possible, Without Any Intermediate Deployment Of "EDTV."

ATV should be implemented in a single step process (NTSC to HDTV) by adopting a system standard for HDTV in the first instance. Such a process would minimize overall industry investment, would avoid interim standards and the

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19/ Further slippage in that schedule should be discouraged, so as to reduce the risk that terrestrial broadcasters will be prevented from implementing HDTV in time to remain competitive with alternative video distribution media.

cost for their continued maintenance, would avoid unnecessary consumer confusion, and would hasten the speed with which HDTV could penetrate the American market.[20] (¶ 12) Given a single step process, receiver manufacturers could design a family of television sets which appear at different price points in the market, all of which use the HDTV signal standard but which offer different levels of performance. NA Philips believes that such a scenario would invite the broadest participation on the part of the public.

Two step implementation -- moving from NTSC to EDTV and then to HDTV -- will cost time, leave broadcasters at a competitive disadvantage,[21] create new levels of compatibility and complexity which must be carried into the future,[22] introduce consumer anxiety (to be accompanied by lower sales), and destabilize the industry by heightening competition among different modes of television program delivery. None of these problems, it bears emphasis, would be associated with IDTV as an optional, interim, first step.

20/ It is self-evident that it would be more expensive to implement ATV in two steps than in one: certainly at least some equipment would have to be replaced, some unnecessary costs incurred, and some additional preparation required.

21/ Alternate media would implement HDTV, while broadcasters would have only EDTV.

22/ HDTV would have to be compatible with both NTSC and EDTV.

H. Any HDTV Production Standard Should Be Built On NTSC Parameters; No Arbitrary Production Standard Should Be Permitted To Dictate Receiver Characteristics.

A U.S. production standard should be consistent with transmission standard formats. The needs of transmission services and the embedded base of NTSC receivers should drive any decisions concerning production standards, not vice versa. Accordingly no production standard should be imposed during testing of candidate ATV systems; instead systems should be judged on the basis of 35mm film.[23] (¶ 21)

HDTV production standards will be important to program suppliers, delivery media and consumers. Degradations in the received quality of material due to conversions from production standards incompatible with transmission standards will defeat the raison d'etre of HDTV. A production standard should be selected that is compatible with the chosen transmission system.

Because most of the proponent HDTV systems are based on either 525/59.94/1:1/16:9 or 1050/59.94/2:1/16:9, the production standard used for testing and selected for adoption should be based on these parameters. A compatible production standard will eliminate the artifacts and

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23/ Film shot at 60 frames/second would be free of motion artifacts and would more closely represent live video camera quality.

degradation of picture quality that would otherwise result from the conversion process, as well as the need for costly conversion equipment. The 1125/60 production standard serves none of these requirements; it requires line rate conversion and complicated field rate conversion without any advantage to the U.S. program provider and with considerable disadvantage to the delivery media. It is for these reasons that NA Philips has strongly supported the efforts of broadcasters and equipment manufacturers to develop and submit for approval a 1050/59.94/2:1/16:9 production standard.

IV. NAPC'S ACTIVE ROLE WILL CONTINUE.

NA Philips welcomes this opportunity to respond to the Further Notice. We look forward to reviewing the comments of other interested parties and continuing the dialogue in our reply comments. We shall continue to participate actively in this proceeding before the Commission and in the work of the Advisory Committee.

The ultimate aim of the regulatory process should be to select the candidate system which will best meet the needs of video delivery media and -- especially -- the needs of consumers. We are justifiably proud of HDS-NA, and

expect that a consensus on the merits of our system will continue to grow.

Respectfully submitted,

NORTH AMERICAN PHILIPS
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